



FAA
Aviation Safety

SPECIAL AIRWORTHINESS INFORMATION BULLETIN

SAIB: AIR-22-15

Date: June 15, 2022

SUBJ: Bonded Structure Inspection

This is information only. Recommendations aren't mandatory.

Introduction

This Special Airworthiness Information Bulletin advises owners, operators, maintenance technicians, and inspectors of an airworthiness concern on **True Flight Holdings, LLC (True Flight) Model AA-1, AA-1A, AA-1B, AA-1C, AA-5, AA-5A, and AA-5B airplanes**, specifically the importance of inspecting the bondlines on the airplane, including the bondlines on the wings and aft fuselage.

At this time, the FAA has determined that the airworthiness concern is not an unsafe condition that would warrant airworthiness directive (AD) action under Title 14 of the Code of Federal Regulations (14 CFR) part 39.

Background

Following an accident involving a True Flight Model AA-5 airplane in January 2021, the FAA issued AD 2021-14-12 on July 12, 2021, which applies to Model AA-1, AA-1A, AA-1B, AA-1C, and AA-5 airplanes. AD 2021-14-12 requires a one-time inspection for bondline corrosion and delamination of the horizontal stabilizer, including the attachment point of the elevator. The accident airplane's elevator partially separated from its attachment to the horizontal stabilizer, which resulted in flutter of the elevator and near loss of pitch control. This airplane was later found to have severe bondline corrosion and delamination in certain areas, including the outboard rib of the horizontal stabilizer and the trailing edges of the elevator trim tabs. The damage can readily be seen in Figure 1, below.

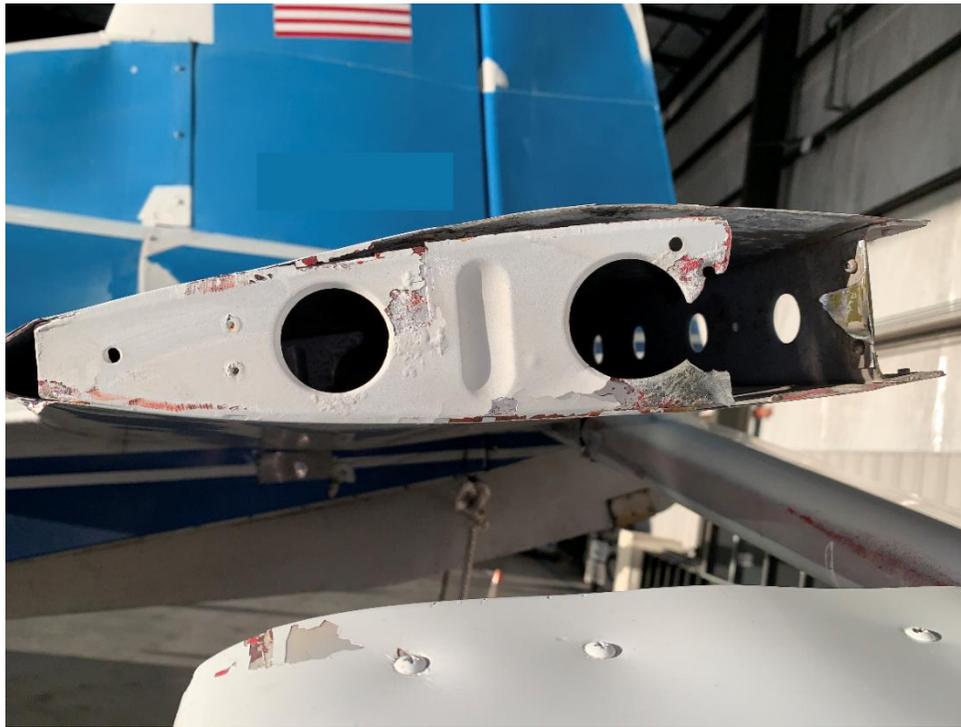


Figure 1. Severely Damaged Horizontal Stabilizer with Skin Delamination and Indications of Bondline Corrosion, Model AA-5

The FAA has received reports of other True Flight model airplanes (those referenced in the Introduction section), which share similar bonded construction, exhibiting damage similar to the accident airplane. Although AD 2021-14-12 requires inspections of the area attributed to the accident, all bonded structures should be inspected. Bonding of structure requires strict controls to ensure a secure bond; and while this bond should remain secure for a long time, as airplanes age and are exposed to the environment, there is the possibility of weakening of and damage to this bond. If the structure is compromised, the airframe may not be able to support the required operational loads. Because of this, it is critical to regularly inspect the bondlines of the entire airplane.

Inspection of bondlines is specified in the model specific maintenance manuals at annual or 100-hour inspections. Details can be found in the “Servicing” chapter for AA-1, AA-1A, AA-1B models, or the “Time Limits – Maintenance Checks” chapter for the Model AA-1C, AA-5, AA-5A, and AA-5B airplanes. At a minimum, the instructions specify, “Inspect bondlines for any indication of damage, peeling or cracks.” Further details are provided in the following subsections titled, “Bondline Damage, Inspection Procedures and Repair.”

True Flight Aerospace, LLC introduced Service Bulletin SB-195, Revision A, dated June 1, 2021, (SB-195A) to address this bondline delamination issue. SB-195A specifies enhanced inspection instructions that cover the whole airplane structure at every annual inspection. The instructions cover inspection of whole airplane bondlines for delamination and interiors of surfaces for corrosion, corrosion treatment, and reference to bondline and corrosion repair instructions as needed. While SB-195A is not mandatory, the FAA believes the inspection methodology is beneficial to aid the airplane owner or maintenance personnel in detecting the issues described herein.

Skin delaminations are typically found on trailing edges of control surfaces, but can occur along the flanges of wing or stabilizer spars, other externally accessible bondlines, and can also occur along less-obvious internal bondlines. Close attention should be paid to obvious joint separation, corrosion

along edges, hairline cracks in joints, and a bulging surface along an internal bondline (such as a rib not being visible on the outside of the skin). All potential indications of bondline damage should be further investigated in accordance to the model specific service information. This would typically involve a basic tap test with a coin along the area in question, listening for a hollow sound, or a more advanced tap hammer device. If there is any doubt or the area cannot definitively be cleared an internal inspection should be performed.

Please note that this SAIB is unrelated to a previously addressed issue with the FM-123 bonding agent, commonly known among owners as “Purple Passion”, used in production of certain airplanes. Inspection of bonded structure is critical regardless of the materials used, and is especially so as age and environmental factors tend to degrade the integrity of the structure over time.

Recommendations

The FAA recommends that the actions outlined in the affected airplanes’ maintenance manual, as well as SB-195A, be followed at the earliest opportunity and at the annual or 100-hour inspections.

For Further Information Contact

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